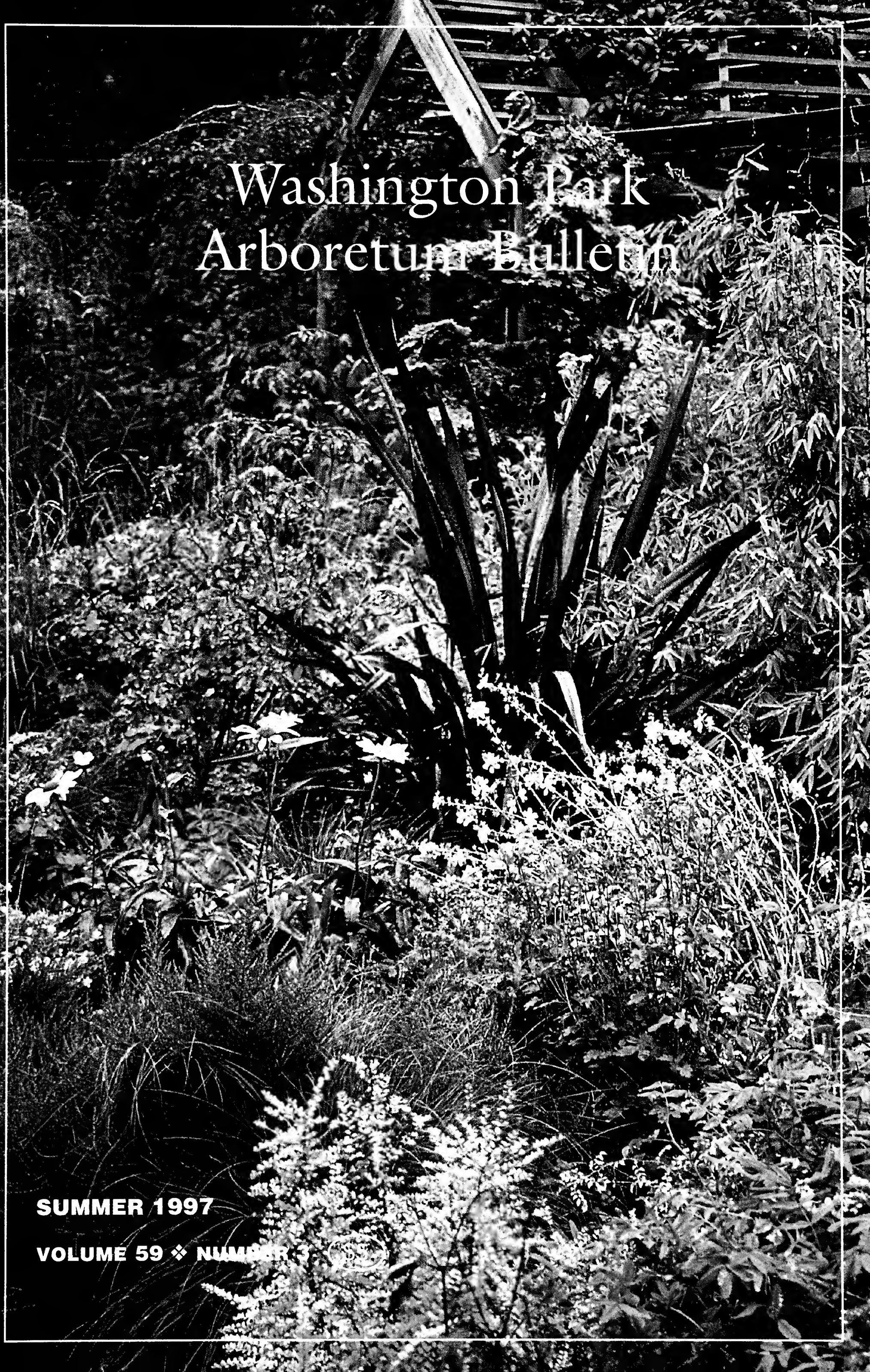
Washington Park Arboretum Bulletin



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The Cover: Heronswood in July

Photo courtesy Daniel J. Hinkley

The golden-touched background conifer *Chamaecyparis obtusa* 'Crippsii' reaches 20 feet, and can also be seen in the Arboretum (36-2W). *Fargesia nitida*, fountain bamboo, is to the right. Arching in front of *Phormium* spikes (New Zealand flax) are graceful stems of pink *Sidalcea*. The eye-catching golden yellow evergreen *Lonicera nitida* 'Baggesen's Gold' glows in the foreground.

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The Arboretum Foundation is a nonprofit organization that was chartered to further Washington Park Arboretum development, projects, and programs through volunteer service and fund raising. Its mission is to ensure stewardship for the Washington Park Arboretum, a Pacific Northwest treasure, and to provide horticultural leadership for the region. This stewardship requires effective leadership, stable funding, and broad public support.

Washington Park Arboretum (WPA) is administered cooperatively between the University of Washington, its Center for Urban Horticulture (CUH), and the City of Seattle Department of Parks and Recreation. The programs and plant collections are a responsibility of CUH.

WPA is a living plant museum emphasizing trees and shrubs hardy in the maritime Pacific Northwest. Plant collections are selected and arranged to display their beauty and function in urban landscapes, to demonstrate their natural ecology and diversity, and to conserve important species and cultivated varieties for the future. The Arboretum serves the public, students at all levels, naturalists, gardeners, and nursery and landscape professionals with its collections, educational programs, interpretation, and recreational opportunities.

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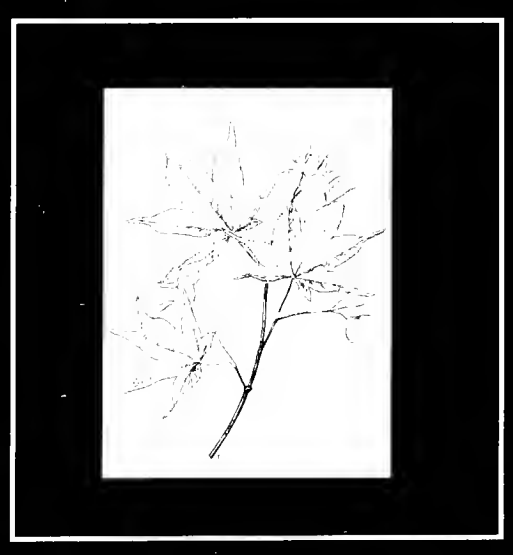
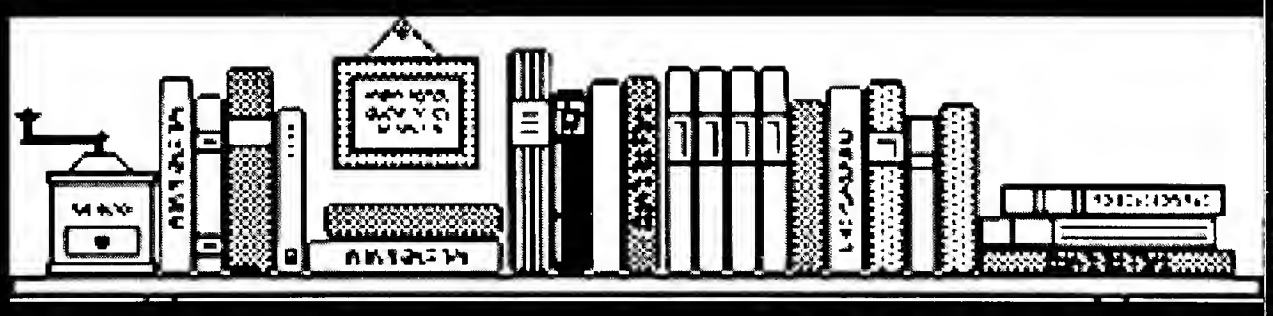


Where in the Arboretum? The maple leaf, a symbol of Washington Park Arboretum, appears near articles on how to find plants in the arboretum.



New on the Shelves Page 24

Best Flowering & Fruiting Crab Apples for Western Washington

TEXT BY TRACY OMAR
PHOTOS BY JOY SPURR

In the Pacific Northwest, our mild climate allows us to grow many fine, small spring-flowering, summer fruiting trees. Although not often planted, there are a large number of well-regarded crabapple cultivars that do both. In full bloom, these trees give the most spectacular spring shows. They also remain popular for their colorful fall fruit displays, in a range of colors.

Crab apples, however, are very disease prone in the Pacific Northwest. For this reason, Washington Park Arboretum continually evaluates the new cultivars that add beauty to the garden while being the most disease resistant. As a member of the National Crabapple Introduction Program (NCIP), the arboretum is one of the US evaluation plots to determine which of the newer crabapple introductions are the best performers for each region.

In the Northwest, crab apples are plagued by foliar diseases, especially apple scab. In recent

Photos

OPPOSITE PAGE

TOP: NEWLY PLANTED CRAB APPLES IN THE ARBORETUM'S CONIFER MEADOW. BOTTOM: 'MARY POTTER', FRUIT.

THIS PAGE

UPPER LEFT: 'PRAIRIE MAID' PROVIDES COLORFUL FALL FRUIT AND FOLIAGE.

RIGHT: UPPER,'WHITE ANGEL' FRUIT IN OCTOBER. MIDDLE, 'DOUBLOON'. BOTTOM: POPULAR OLDER CULTIVAR, 'PROFESSOR SPRENGER'.

years, new cultivars have been selected for resistance to these diseases, and the improvements are striking. Among the 67 older cultivars in the arboretum's collection, nearly fifty percent have been rated as severely affected by scab. In contrast, of the 15 cultivars that the arboretum evaluated as part of NCIP, none has been rated as severely affected, and 11 are rated as scab resistant. Another important feature of these newer cultivars is their compact habits, desirable in many home landscapes. Most are beautiful small trees, which mature at only 10 to 12 feet tall.

Five Beautiful, Scab-Resistant Cultivars

In April 1993, the arboretum received plants of fifteen cultivars to evaluate. They are now in Conifer Meadow, northwest of the Lynn Street pedestrian overpass. These new introductions have been evaluated for three years, and many look promising.

Five of the new cultivars seem suitable for Northwest landscapes. They bear heavy crops of flowers and fruit and appear to be scab resistant. Within the group is a selection of flower and fruit colors, and a variety of growth habits.View these crab apples in fall and spring. Coordinates on the arboretum map are indicated in parentheses; volunteers at the Graham Visitors Center reception desk will provide a map and help you locate each tree.

'Adirondack' (44-5W), introduced in 1987, has dark carmine buds and many white flowers. This cultivar grows slowly, up to 12 feet, with an upright and compact habit; scab is slight. Abundant orange-red fruit persists into winter.

'Doubloon'™ (44-5W), a 1988 introduction, features bright red buds and abundant, double-white flowers. This slow grower is scab resistant. It becomes a rounded tree to 12 feet; the leaves are dark green and the abundant fruit is yellow.

'Prairie Maid' (44-5W), which is scab resistant, was introduced in 1987. Bright purple buds and numerous deep pink flowers grow on this compact, densely branched tree. It reaches to 15 feet with coppery new leaves in spring, turning dark green. The heavy crop of fruit is dark orange.

'Sinai Fire'™ (46-5W), introduced in 1991, is also scab resistant. Brilliant red buds open to plentiful white flowers. Characterized by slightly weeping branches, this lovely upright tree is a vigorous grower to 20 feet. Leaves are a glossy dark green, and the profusion of fruit is orange-red.

'Winter Gem' ™ (45-5W) produces spring buds that are bright pink and copious flowers that are large and white. Introduced in 1988, its growth is very vigorous for this scab-resistant tree, which has an upright habit to 20 feet; it grew eight feet in three years. The large, dark green leaves complement a heavy crop of small, bright red fruit.

Comparable New and Old Cultivars: Which to Choose?

While the five cultivars described above were generally regarded as the best, recent evaluations show that most of the new cultivars tested by the arboretum have good potential as landscaping plants in the Pacific Northwest. Most are scab resistant and produce abundant flowers and fruits. But how do they compare with the best of the older cultivars? Are the new introductions really better?

It is easy to compare the relative merits of the 15 newer cultivars. All are of about the same age and vigor, and all are planted in roughly equivalent landscape conditions and maintained the same way.

In contrast, the older cultivars in the arboretum are found growing under a variety of conditions, from full sun to dense shade and from heavy clay to light sandy soil. Maintenance levels are also highly variable, and many are overmature trees of low vigor. Evaluating these older cultivars in relation to one another is very imprecise. Comparing their performance to those of the newer cultivars is even more difficult. Even recognizing these difficulties, however, some generalizations can be made.

Of the 20 plants recommended in a study by Robert Norton and Jacky King (*Washington Park Arboretum Bulletin*, winter 1992–93, 54:4), six were evaluated in the arboretum.

'Donald Wyman' (15-2W) was introduced around 1970. It consistently produces abundant white flowers and a heavy crop of bright red fruit that persists well into winter. Unfortunately it is moderately susceptible to scab and most years would benefit from spraying. In our evaluations, 'Silver Drift' and 'Winter Gem' proved more disease resistant, and produced equivalent dis-

plays of flowers and fruit.

'Mary Potter' (13-3W) was introduced about 1947. Only 10 feet tall but with a 15-foot spread, this tree may be too large for small yards. The wonderfully fragrant, large white flowers were only moderately floriferous in our evaluations. The dark red fruits, however, were abundant and lasted well into winter. It is very scab resistant, and none of the new cultivars improves on this one.

'Professor Sprenger' (44-5W), introduced in 1957, consistently produces an abundance of fragrant white flowers, tinged with pink. Though having very good scab resistance, the fruiting has been inconsistent. Some years, a heavy crop of bright orange fruit lasts well into winter. Unfortunately, however, in more than half the years very few fruits are formed. Of the new cultivars, 'Sinai Fire' and 'Adirondack', are similar, but neither is truly an improvement on 'Professor Sprenger' in the years that it produces fruit well. The other two are, however, more reliable in fruit production.

'White Angel'™ (16-3W), introduced in 1962, has a consistently spectacular display of large, very fragrant white flowers on a 20-foot tree. Fruit production is also consistently heavy, with large crops of scarlet-red fruit persisting well into winter. The scab resistance is very good, and none of the new cultivars are an improvement.

In addition to the cultivars recommended by Norton and King in their article, they also suggested two *Malus* species:

Malus sargentii (40-3E, 45-5W, 45-6W). In arboretum evaluations, this species performed as well as the best cultivars. Each spring, trees are covered with fragrant white flowers. Although some say this species only fruits heavily every other year, past indications are that it produces an abundance of small red fruits each fall. Though the fruit is not as persistent as that of some cultivars, none can top this species for overall effect of flowers or fruit, and the trees have proven to be very scab resistant.

Malus tschonoskii (44-6W). In the arboretum evaluations, this species did not compare well to the best cultivars.

Two other older cultivars stood out in our evaluation, and they perform as well as any of the newer ones.

'Golden Hornet' (33-5E), introduced in 1955, has large, abundant white flowers and is very scab resistant. The annual crop of large golden-yellow fruit is also prolific and adds landscape color well into winter.

'Henry Kohankie' (33-5E), a 1965 introduction, also is covered with a plethora of large white flowers. Carmine-red fruit crops are heavy, and the tree is very scab resistant. This cultivar needs a larger space, reaching 20 feet tall and wide.

Washington Park Arboretum will continue evaluating crab apple cultivars. Future evaluations will look at a broader range of diseases, including mildew and rust. At this point, however, it is safe to say that there are a number of excellent disease-resistant cultivars to recommend for landscape use.

If you are looking for a small, spring-flowering tree with ornamental fall fruit that frequently adds color into winter, come to the arboretum and look over the crabapple cultivars in the evaluation plots. You will find a wide range of growth habits, textures, and flower and fruit colors. Personal taste will dictate which appeals to you, but any can be recommended.

Tracy Omar is the former registrar of Washington Park Arboretum. He currently is the assistant curator of the Desert Botanic Garden, Phoenix, Arizona.

In the Washington Park Arboretum

BY JOHN A. WOTT, DIRECTOR

Public gardeners and their counterparts at home benefit when university students carry out the important missions of the arboretum—research, education, conservation, and display. While learning and fulfilling degree requirements, some collegiate scholars pursue information about garden health and maintenance. Others work on programs that teach younger students about gardening and nature.

For example, quite a few studies are coming out of the Center for Urban Horticulture, such as Mark Atkinson's studies on soil compaction, which will help explain its effects on tree health.

Lisa Soderquist has two projects. She studies 12 plants that are difficult to root and is verifying the identification of the arboretum's hybrid rhododendrons.

Special collections in the arboretum get installed, age, and decline. Alyssa Larson's evaluation of

THE ARBORETUM'S IVY LEAGUE: VOLUNTEERS FROM THE MONTLAKE COMMUNITY, CH2M HILL, AND ONYX SOFTWARE CORPORATION REMOVED BRUSH AND INVASIVE ENGLISH IVY FROM THE GROUNDS ON EARTH DAY 1997. PHOTO BY JOHN A. WOTT

the eucalyptus collection will help determine future maintenance, enhancement, and change.

While learning and getting degrees, several college students are concerned with teaching younger students.

Heather Moss of Seattle University received credit for designing activities for several Branching Out programs, which have completed their first year. Thanks to Branching Out, youth from the Yesler and Garfield Community Centers have visited the Arboretum twice a month since November 1996. Activities to date include drum making, nature and dance activities, making recycled paper, garden design, terrarium making, container gardening, and making bird feeders.

Demian Rybock is working on discovery stations designed to help children enjoy exploring the arboretum.

Some children and their families use Explorer Packs, which are specialized kits that children and adults can borrow as they investigate the arboretum. Erin Lee is working to expand this popular program.

Volunteers

Volunteers have always helped the arboretum grow and thrive. Recently, volunteers Jeannine Curry and Jean Gillespie were selected as the two first recipients of the Brian O. Mulligan CUH Outstanding Volunteer Award. Jean has been a long-time receptionist at CUH and regularly volunteers as a member of the hortorium group and the craft group that makes dried flower cards and key chains. She also has assisted with the Saplings program for elementary school children.

Volunteer Jeannine Curry has led arboretum tours for over 27 years, volunteers at both the front desk and gift shop, and assists in many office procedures. She also is on the editorial board of the *Bulletin*, as secretary and author.

There are other hands-on volunteers that keep the arboretum beautiful. Some come from the Arboretum Foundation's units—specialty groups in which members learn about horticulture and participate in fund raising. More and more of these units and their members are turning out for the popular Tuesdays in the Garden. Unit 52, for example, weeded in Loderi Valley in May, and the arboretum staff provided an educational tour as part of the day's program. Find out about units by calling 325-4510.

Occasionally, other volunteer organizations give their time and energy to the arboretum. For example, on May 8, the Northwest Girlchoir again sang their way through their annual weeding along a section of Azalea Way.

Volunteers also serve as guides in the arboretum. Recently, a 22-page book was published especially for guides but will soon be available to everyone. Written by Kimberly Mills, illustrated by Tamara Underhill, and designed by Kimberly Carney, it is available in the Graham Visitors Center.

To volunteer with the University of Washington projects on site at the arboretum, call 543-8800. To find out about Arboretum Foundation units and projects, The Arboretum Foundation can be reached at 325-4510. If you would like to volunteer at the Center for Urban Horticulture, site of the hortorium and the Miller Horticultural Library, call 543-8616.

Arbor Day

On Washington State Arbor Day, April 8, and National Arbor Day, April 24, member arborists of the Pacific Northwest Chapter–International Society of Arborists volunteered time to prune large pines and oaks along Lake Washington Boulevard East, near Madison. Participating were Renaissance Gardens, Blue Heron Tree Service, Kennaugh Horticultural Services, Ian MacCallum, and City Foresters, Inc.

Earth Day

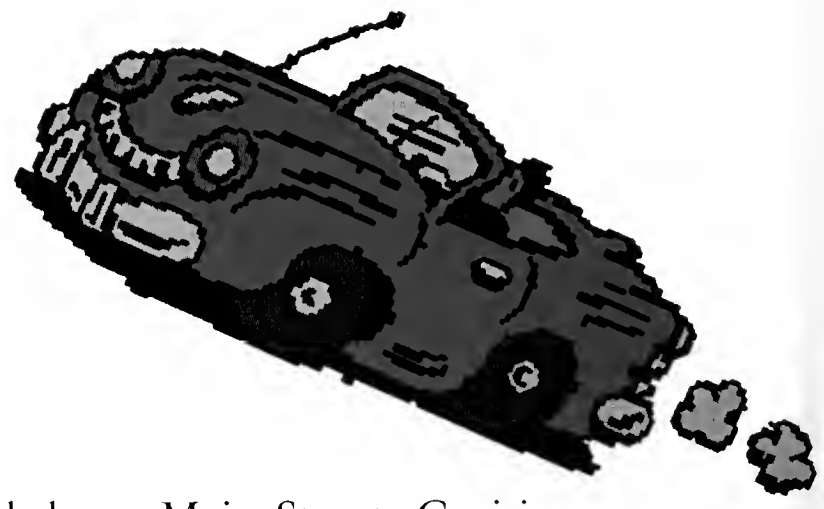
The Student Conservation Association coordinated Earthworks Northwest on Saturday, April 19. The projects at the arboretum were a great success, with our largest turnout in this event. Brush and ivy were removed by supporters from CH2M Hill, Parametrix, Inc., Onyx Software Corporation, and the Montlake Community. Parametrix has since returned and adopted an area near the Lookout. See the article entitled "Looks are Deceiving" in this issue to find out more about the effects of ivy and other invasive plants on your garden.

John Wott, professor at the University of Washington, is the director of the Washington Park Arboretum.

Cruising in the Afternoon

Visit gardens and arboreta around the world, via the Web.

BY BETH BURROWS



I grabbed a friend, hopped in the car, and cruised down Main Street. Cruising was a great way to spend a rainy afternoon—talking with friends, making new ones, and finding out the latest news.

I don't do much hopping these days and my friends are pretty safe from being grabbed, but I am still cruising. Now though, I leave my car behind as I cruise the Internet for gardening information. Why cruise the Internet? For the same reasons I read gardening publications and books. I'm looking for information, personal experiences, how-to instruction, and a bit of fun. All this can be found on the Internet, easily and whenever I want it.

In days past, you needed certain things to cruise successfully. Back then you needed a driver's license, a car filled with gas, and a friend to ride shotgun and advise you on all the hot spots to check out. The same is true for cruising the Internet.

To cruise the Internet successfully, you need a computer instead of a car, as well as a modem, a phone line, access to the Internet, and a Web browser such as Netscape Navigator. The modem should be at least 28.8 Kbps to improve the time to download garden pictures onto your computer.

Our first stop is similar to going to Dick's Drive-In—a place where the action is. On the Internet this is called a search engine. Unfortunately there are no milk shakes on the menu. Nonetheless, we can better organize our visits with the help of a search engine. My favorite is Alta Vista at:

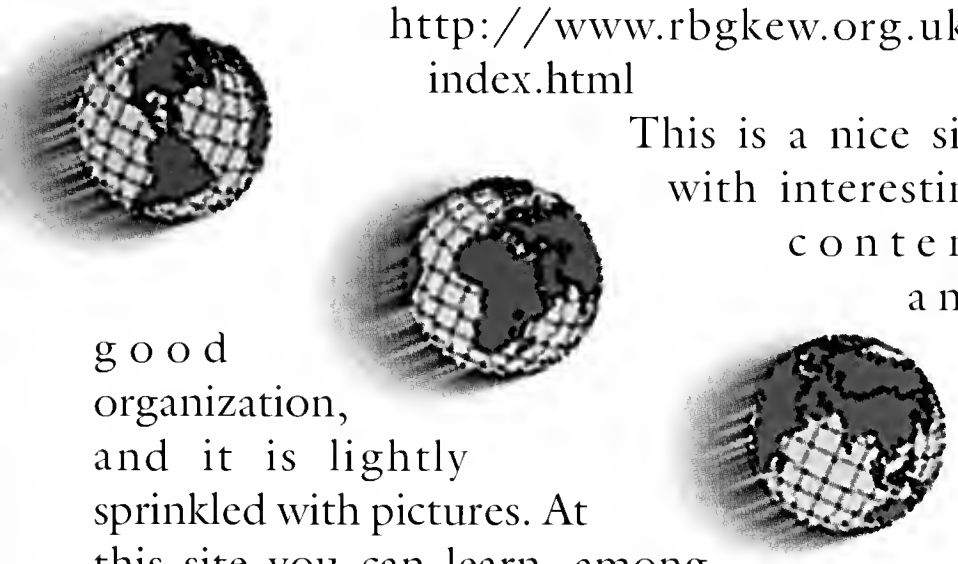
http://www.altavista.com/

Tour the Web site at Queens Cottage Grounds & Pinetum, Kew (in Great Britain), and you will see this picture on the home page (left).

Once you reach the search engine, type in your topic of interest. I searched for "arboretum" and "woody plants." The search engine presented a list of Web sites that contained information on these topics and sorted them into a list from most relevant to least relevant.

Let's cruise right to the Royal Botanic Gardens in England and, specifically, the Arboretum at Kew:

http://www.rbgkew.org.uk/index.html



This is a nice site with interesting content and good organization, and it is lightly sprinkled with pictures. At this site you can learn, among other things, the history of the gardens. For instance, they were founded in 1759 and feature a tree collection of more than 11,000 specimens. Five original trees from 1760 still survive. Even view a listing of plant collections. The gardens have experienced their ups and downs, times of attention and times of neglect. The good news is that the gardens have steadily improved since the 1970s, though a recent storm caused the loss of 650 trees including a 200-year-old oak and some "botanical rarities." In 1992, a magnolia walk and a large number of lilacs were added to the gardens. Planning a visit to Kew? This site provides valuable trip planning specifics.

We can move closer to home with a visit to Meerkerk Rhododendron Gardens on Whidbey Island:

http://www.dsinclair.com/~kabowers/woodland.html

I really like this site. It has some fabulous pictures, good descriptions of the gardens, and even an online tour. I also enjoyed the text scrolling across the bottom of the screen informing me of their plant sale. This garden is "ten acres of bulbs, flowering ornamental trees, and thousands of rhododendrons." It is located on 43 acres of the Meerkerk Woodland Preserve with three miles of nature trails to explore.

If you would like to cruise additional arboreta and botanical gardens, go to the Internet Directory for Botany: Arboreta and Botanical Gardens:

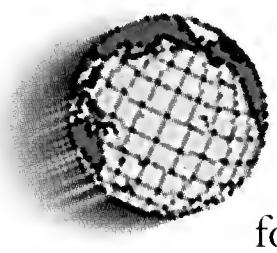
http:/www.helsinki.fi/kmus/botany.html

Here you will find one of the most comprehensive botanical directories on the entire Web, including many hot links to arboreta and garden sites to visit worldwide.

Getting serious, we can cruise for gardening knowledge to bring into our own gardens. The University of Georgia site is:

http://www.ces.uga.edu/pubcd/b949-w.html

Its document on the "Basic Principles of Pruning Woody Plants" is easy to understand and accompanied by clear, illustrative pictures. The information covers all aspects of pruning woody plants including types of cuts, responses to pruning, and the best times to prune.



Another informative site, the University of Nebraska-Lincoln is (no spaces):

http://ianrwww.unl.edu/IANR/PUBS/extnpubs/forestry91-1050.htm

Look there for "Woody Landscape Plants: Selection and Planting." This document covers the how-tos and why-fors of selecting planting locations, selecting trees and shrubs, preparing the soil, planting techniques, and caring for trees and shrubs after planting.

Also worth a look is Garden Escape:

http://www.garden.com/

The Garden Escape site includes a magazine, garden design planner, and a plant finder to locate plants that match your specific needs in terms of sun, color, water, and skill level.

I see that it is time to cruise on home, but remember this fascinating world of online arboreta, gardens, and gardening information.

Beth Burrows enjoys bringing the best of Pacific Northwest gardening information to local gardeners.

Reference

Feeney, Stephanie. *The Northwest Gardeners' Resource Directory.* 7th ed. Bellingham, WA: Cedarcroft Press, 1997. The chapter on "Gardening in Cyberspace" is for both the novice and the experienced gardener. Find copies at the Miller Library or The Arboretum Gift Shop.

WHERE IN THE ARBORETUM?
NEWLY PLANTED TREES & SHRUBS

Ask at the Graham Visitors Center reception desk for help in finding these trees on an arboretum map, using coordinates in parentheses.

Abies firma, the Momi fir from Japan, is northeast of Rhododendron Glen (16-4E).

Abies lasiocarpa, the subalpine fir, is a Northwest native. Find it at the head of Rhododendron Glen (15-5E).

Acer crataegifolium, the hawthorn-leaf maple, is from Japan. It is planted among the Asiatic maples (25-B).

Acer palmatum 'Waterfall', a Japanese maple, is near one of the ponds (32-3E).

Pinus sabiniana, the digger pine from California, is now in the Pinetum (36-6W).

Pyrus ussuriensis, a flowering pear from Manchuria, is north of the Look-out (11-4E).

Quercus polymorpha, an oak from Mexico, is in the Puget Sound Hybrid Bed (27-1W).

JOY SPURR

A NEW HAWTHORN-LEAF MAPLE, ACER CRATAEGIFOLIUM, HAS BEEN PLANTED IN THE ARBORETUM. THE SEEDPODS CAN BE SEEN IN SPRING.

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ABOVE: The Fort Lewis Artillery Impact Zone 91st Division Prairie as it burns and renews at the same time. OPPOSITE PAGE: UPPER RIGHT: Mortar Point 10 at Fort Lewis is a research and restoration site. MIDDLE RIGHT: *Lupinus lepidus* grows on the 13th Division Prairie, as does *Fritillaria lanceolata* (chocolate lily), LOWER RIGHT. LOWER LEFT: A western bluebird is one of many species living in this unusual habitat.

The Tacoma Prairies

Islands of Grass in an Ocean of Trees

PHOTOS & TEXT BY RICHARD ROBOHM

I am crouching over research plots at Fort Lewis's 91st Division Prairie. It's early on a fine, breezy July morning as I stoop and close the jaws of my digital calipers on another plug of bunchgrass.

Suddenly, the concussion of a 155-mm howitzer rocks me onto my heels. The 210th Field Artillery Brigade has, in the military idiom, "placed accurate and lethal fires on target."

So begins a day of research in the Artillery Impact Zone at Fort Lewis south of Tacoma, Washington.

A graduate student at the University of Washington's Center for Urban Horticulture, I am studying restoration ecology. I am also the beneficiary of a paradox: The same murderous thunder that pounds me with incessant shock waves is the only reason the grassland I study is still here.

How this island of grass came to be amid the Pacific Northwest's ocean of trees is a story of ice and fire, written in pollen on the clay tablets of Pleistocene lakes. Why it has been shrinking for more than a century and what we are doing about it is also part of the story. But first, as Antonio says in *The Tempest*,"What's past is prologue."

Glacial Delivery

Travel south from Seattle through Tacoma, and you cross the Puyallup River, its chilly waters nursed by glaciers from Mount Rainier. About 15 miles south of Olympia, you cross another boundary, a largely obliterated line of rubble in a ragged arc from Eatonville on the east to the Black Hills, southwest of Olympia, on the west. This stony trace marks the southern limit of a mammoth continental glacier, a frozen ocean of fresh water that sprawled over the landscape during the last Ice Age, 14,000 years ago. Mount Rainier's frozen juggernauts would seem feeble in comparison.

As the earth warmed, the glacier melted back toward the Arctic, leaving in its wake a landscape of lakes, ridges, and troughs whose north-south alignments betray the hand that sculpted them. Also left behind by the retreating ice were vast plains of sand, gravel, and cobbles, as ice dams burst and meltwater streams flowed first one way and then the other over the newly exposed landscape. The fast-draining, coarse, glacial outwash soils that developed from this material still

cover large portions of Pierce and Thurston Counties today.

The Pollen Record

Wall-to-wall ice thousands of feet thick does not leave behind any plants to ponder for clues to the ecological past. Thanks, however, to the esoteric discipline of palynology—the study of pollen—and some long-lived lakes just beyond the reach of glacial ice, we have a fair idea of the vegetation that has dominated south Puget Sound during the last 25,000 years.

Pollen that lights on a lake soon sinks, inscribing a dated record on the layered sediments of the lake bottom. Thousands of years later, palynologists bring these chronicles back to the surface in core samples and then decipher their meaning.

Fossil pollen from the time the glacier started melting 14,000 years ago, until the glacial influence faded out about 10,000 years ago, indicates that a cool, humid climate prevailed. The pollen of Sitka alder (*Alnus sinuata*), lodgepole pine (*Pinus contorta*), Sitka and Engelmann spruce (*Picea sitchensis* and *P. engelmannii*), Pacific silver fir (*Abies amabilis*), grand fir (*Abies grandis*), and mountain hemlock (*Tsuga mertensiana*) predominates in core samples from this frosty time. Many of these species today inhabit the montane and subalpine zones and are no longer found in the lowlands.

In the postglacial conditions that followed during the next few millenia, moderating temperatures promoted the expansion of red alder (*Alnus rubra*), Douglas-fir (*Pseudotsuga menziesii*), willows (*Salix* spp.), and other familiar low-elevation trees. Oak made an auspicious reappearance in the pollen record a little over 10,000 years ago.

Two factors distinguished the next phase in the history of the gravelly outwash plains. They defined features that, although in decline, remain today. A warm and dry period, known as the Hypsithermal Interval, set in about 8,500 years ago. At roughly the same time, humans moved into the neighborhood.

The Human Element

The warmer and drier Hypsithermal fostered the dominance of oak savanna, an open landscape of grasses and other herbaceous plants accented by scattered trees. The pollen of Garry oak (*Quercus garryana*), common camas (*Camassia quamash*), Ponderosa pine (*Pinus ponderosa*), and Douglas-fir, and spores of the sun-loving bracken fern (*Pteridium aquilinum*) characterize the core samples from this period. The hot, dry summers of the time challenged the capacities of trees to draw water out of the droughty soil, and to survive the fires that regularly scorched the parched land. While life for trees got harder, the drought- and fire-resistant oaks that persevered and the herbaceous plants that abounded on the sunny plain were turning the grassland into a breadbasket for its human inhabitants.

Rhizomes of bracken and desert parsley (*Lomatium* spp.), bulbs of camas and chocolate lilies (*Fritillaria lanceolata*), and acorns of Garry oak provided both starch and protein for the Native American diet. They were abundant, easily gathered or dug, and kept well for use in trade or to assuage winter hunger.

In a kind of vegetable husbandry, the Indians torched the prairies periodically to keep them free of trees and shrubs. This not only made it easier to watch for enemies, hunt, and travel in the wide open spaces: It also made it possible for sunlight, which in the forests fueled the growth of prodigious conifers, to make it all the way down to the ground floor. There the sun warmed the soil and called forth the light-loving plants that filled the Native American larder.

The Incredible Shrinking Prairie

Long after the cool, moist climate we enjoy today in Puget Sound had displaced the Hypsithermal, burning by Native Americans continued to exclude trees and shrubs from the Tacoma prairies. With burning suppressed in most areas for the last 150 years, however, ample rainfall and mild summer droughts have invited trees back onto the outwash plains. Like green grenadiers in set-piece formations, Douglas-firs are marching implacably onto the open field, abetted by platoons of Scots broom (*Cytisus scoparius*) ruffians.

Nineteenth-century surveys, when compared with recent aerial photographs, show that forests of Douglas-fir have been advancing on the prairies at a rate of several feet per year for more than a century. The invasion of non-native Scots broom, virtually unknown on the prairies 50 years ago, has exacerbated an already bleak state of affairs.

Ironically, the Army's activities in the Artillery Impact Zone and in training areas has maintained a semblance of the traditional fire regime. Training areas and jump zones at Fort Lewis are kept free of encumbering shrubs, either through ignition by exploding ordnance or through prescribed burns.

As if the inexorable annexation of prairie by Douglas-fir forest and Scots broom shrubland were not enough, this conquest is made yet more grievous by an invasion of non-native herbaceous plants. The native bunchgrass is slowly ceding ground to a sod-forming bentgrass (*Agrostis* sp.) and to a rogues' gallery of invasive weeds, including Klamath weed (*Hypericum perforatum*), spotted cat's ear (*Hypochaeris radicata*), English plantain (*Plantago lanceolata*), and oxeye daisy (*Chrysanthemum leucanthemum*).

The bentgrass may be the most insidious of this list, for the way it changes the character of the native bunchgrass prairie. The bluish-green tufts of native Idaho fescue (*Festuca idahoensis*) leave room between them for camas lilies, desert parsley, and other wildflowers to flourish. The bentgrass, on the other hand, straggles over the ground and sends an ungainly network of underground stems through the soil, taking space and nutrients away from everything else. The result is more like a weedy, unmowed lawn than a prairie strewn with wildflowers.

What's So Special about These Prairies?

When thousands of camas blooms paint the prairies blue in May, it might seem obvious why they are worth fighting for. Many other species bloom, less spectacularly, into August.

The aesthetic reward of a wildflower display is compelling, but the prairies' virtues are manifold. These tufted plains are like no other ecosystem in the region. They constitute the northern limit of many species not otherwise found above the Columbia River, and the western limit of species normally not found west of the crest of the Cascade range. Plant and animal diversity in the larger and less disturbed prairies rates among the highest of any ecosystem in the state of Washington. Rare butterflies, pocket gophers, songbirds, western gray squirrels, and several unique plant species call these prairies home. Western Washington prairies also contain an unusual geological formation, the Mima Mounds; the origins of these regularly spaced hills have confounded scientists and kept them quarreling for a century and a half.

Ecological Restoration

Albeit belatedly, people have begun to value these prairies enough to invest time and treasure in conserving and restoring them. The Washington State Department of Natural Resources and The Nature Conservancy of Washington have committed people and resources to reclaiming disturbed and degraded prairies, burning selected patches periodically, logging encroaching Douglas-fir, removing Scots broom, and planting native prairie species.

For its part, Fort Lewis is paying to help heal a ghastly wound at 91st Division Prairie, inflicted in 1994 by unauthorized construction of berms and trenches in a superior and protected native prairie. Planting native prairie species and testing different restoration techniques, The Nature Conservancy and I now share this corner of the Artillery Impact Zone with tanks and artillery, at a safe distance to be sure.

Where Indians once touched firebrands to desiccated grass, gunners now hurl explosives toward distant targets. Where Indians once dug camas bulbs in the cobblestone soil, restoration ecologists now punch carrot-sized holes and fill them with plugs of Idaho fescue. However stunning the contrast from one century to the next, human beings are still finding ways to manage these singular prairies for the sustainable future.

Richard Robohm received a B.S. in botany from University of Washington in 1992, and is completing a master of science degree at the UW's Center for Urban Horticulture. He is chair of the Central Puget Sound Chapter, Washington Native Plant Society.

More Reading

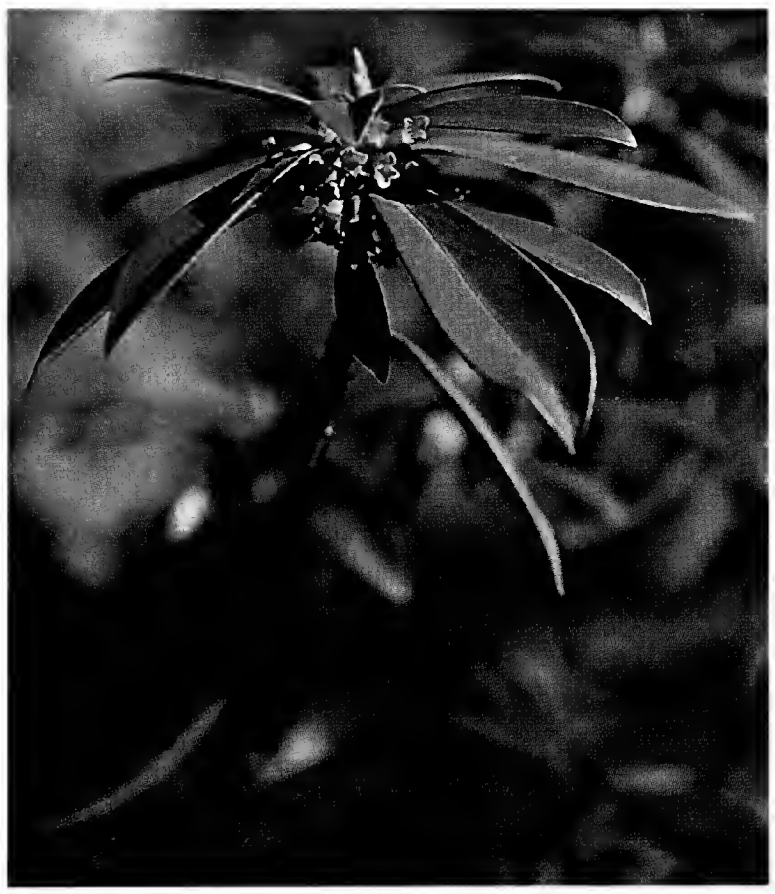
Arthur R. Kruckeberg's *The Natural History of Puget Sound Country* (University of Washington Press, 1991) contains an excellent discussion of south Puget Sound prairies and the Mima Mounds enigma. In addition to Kruckeberg and the works he cites, readers who want to learn more should seek out "The Association between Anthropogenic Prairies and Important Food Plants in Western Washington," by Helen H. Norton (*Northwest Anthropological Research Notes*, 1979, 13: 175–200), available in Special Collections at the University of Washington's main library.

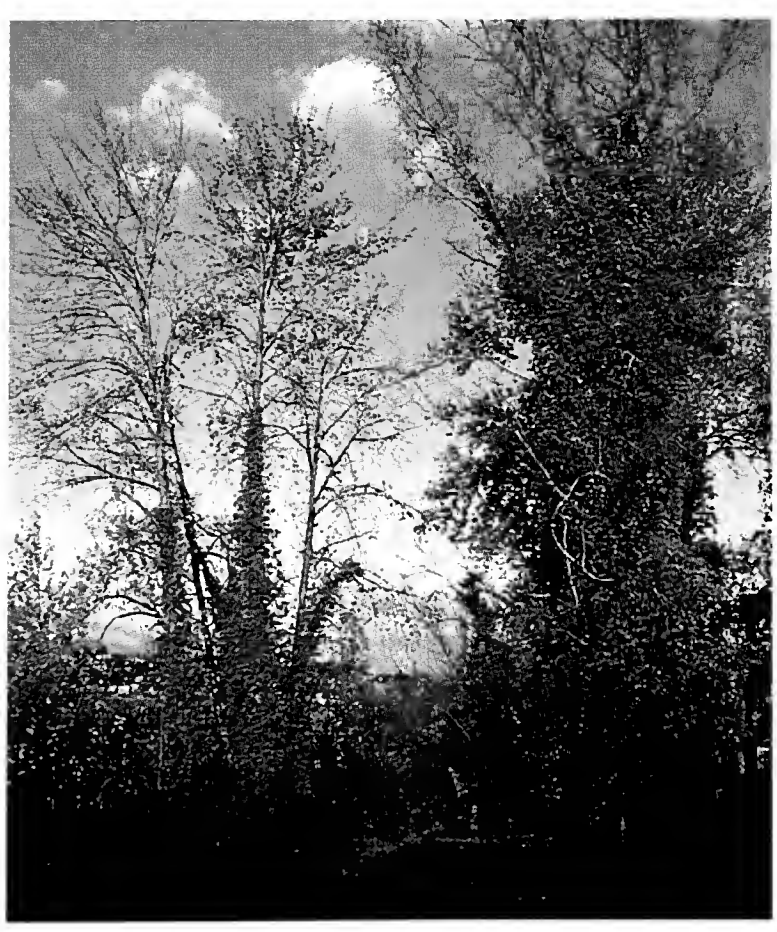
Looks Are Deceiving

English ivy, herb Robert, and Spurge-Laurel

BY CHRISTINA PFEIFFER &
SARAH HAYDEN REICHARD

The generosity among gardeners is uncommon to most other types of hobbyests. Sharing the pleasure and wealth of their gardens by divisions, layers, and seedlings—or maybe just word of favorite plants—unites friends and neighbors. This also holds true among public gardens where plants are freely exchanged internationally.





While plant exchanges are mostly beneficial, enabling us to enrich our gardens with little expense, they are also how we inherit some unwanted, damaging, labor-intensive weed species. This, then, is the story of a small group of plants that initially looked benign, thus were encouraged in the garden, and only later showed their malignant nature.

At Washington Park Arboretum three plants—English ivy (*Hedera hibernica*), herb Robert (*Geranium robertianum*), and spurge-laurel (*Daphne laureola*)—have particularly worn out their welcome. Over time they have proven to be invasive and damaging to both the planted and native landscapes. Once viewed as lovely additions, they are now the subject of intensive control efforts and (sometimes) a few unprintable words.

English Ivy

English ivy (*Hedera hibernica*; formerly known as *H. helix* 'Hibernica' or 'Baltica') has long been cultivated and is perhaps the Pacific Northwest's most commonly cultivated evergreen ground cover.

Over the years, many cultivars of ivy with smaller, delicate leaves have been planted in the arboretum. They have been slow to spread and have generally been problem-free. Sometimes, however, they are overcome by their more problematic cousin, the larger-leafed English ivy. The large-leaf ivy plants seen covering the ground in many parts of the arboretum and climbing trees at the wooded west boundary are an aggressive, fast-growing form that were not intentionally planted.

Ivy's great success can also be devastating to natural areas that they invade. The vines growing along the ground inhibit new plants from germinating and smother smaller plants. As they grow up trees, the evergreen leaves add weight that may lead to limb breakage. When the leaves have water or ice on them they are even heavier and increase the possibility of damage to the tree during a storm.

Ivy, in its juvenile phase, is a woody vine that can reach almost 100 feet. In the creeping juvenile phase, the leaves are three- to five-lobed, and the stems have adventitious rootlets at the leaf node that allow the plant to climb vertical surfaces by adhering to, but not penetrating, bark and brick. Adult flowering stems are erect and

PHOTOS OPPOSITE PAGE: UPPER LEFT: SPURGE-LAUREL (A DAPHNE SPECIES). PHOTO, CUH. LOWER LEFT: IVY INVADING TREES NEAR FOSTER ISLAND. PHOTO BY SARAH HAYDEN REICHARD.

THIS PAGE: HERB ROBERT SQUEEZING OUT NATIVE PLANTS IN THE ARBORETUM. PHOTO BY JOY SPURR. BELOW, COURTESY UNIVERSITY OF DELAWARE.

WHERE IN THE ARBORETUM? DESIRABLE DAPHNES

Daphne species and cultivars are colorful and very fragrant. Unlike the spurge-laurel species, several daphnes are highly valued for winter interest. Find them on an arboretum map, using the coordinates in parentheses.

Daphne x *burkwoodii* 'Carol Mackie' (13-8E) & 'Somerset' (40-2E)
D. genkwa (40-2E)
D. longilobata (25-1W)
D. mezereum form *alba* (34-1E, 40-2E) & 'E. A. Bowles' (32-2E, 34-1E) (*D. mezereum* invades forests and wetlands in parts of the Northeast and Midwest.)
D. odora 'Alba' (JG) & 'Aureo-marginata' (35-1E)
D. retusa (10-3E)
D. tangutica (1S-4E, 25-1W)

non-climbing and the leaves are mostly unlobed. Ivy flowers in the autumn, and the fruits are produced the following spring when they are devoured by robins and starlings (another invader). The vines can persist for a very long time; there have been reports of one that is 433 years old.

Ivy's waxy leaves are virtually impervious to herbicides, but the arboretum staff has had some success using herbicides after removing vegetation with a weed-eater (string trimmer). After cutting, the arboretum immediately applied the herbicide Garlon 4 at the rate of 6.5 oz. per gallon plus Nu-film to increase sticking to leaf surfaces. Nearly two years later the treated plants are not regenerating, but new vines are creeping in from surrounding areas.

The herbicide method, however, also kills adjacent vegetation and should be used only when ivy is the sole plant in the area. Therefore, most control efforts in the arboretum rely on manual labor. Many staff and volunteer hours are spent each year working in the arboretum to keep ivy off trees and in check on the ground but, with mature vines setting seeds nearby, new seedling patches are sprouting up as it is eradicated from other spots.

The challenge is perpetual, as the seed is continually spread by birds perching in trees and shrubs, and it will sprout in shaded undisturbed soils. Because mature reproductive vines are usually found on vertical surfaces, the priority is to remove them from trees in the hopes of slowing the constant spread into new areas and the rein-

fection of cleared ones. It has been successfully removed in several locations. The arboretum's goal is to continue to remove it and establish more appropriate, non-invasive ground covers.

Herb Robert

Herb Robert (*Geranium robertianum*) looks like an innocent and delicate wildflower when it appears in early spring. It is the most extensive weed species in the arboretum, engendering the largest percentage of the weeding load.

This species also adds insult to injury—not only is it a maintenance problem but, as the gardener works to rescue ground covers and small shrubs from its clutches, a foul odor permeates all it touches, exceeding the worst stench of sweaty old socks! The odor is so unpleasant that some prefer the common name "stinky Bob" to the more dignified "herb Robert." The odor may indicate that the species has strong chemicals in its leaves to repel various herbivores. Even slugs appear to decline a nibble of stinky Bob.

Native to England and Europe, *Geranium robertianum* has the longest recorded history of any geranium species because of its medicinal uses for nosebleeds, rashes, bruises, and many other maladies. In medieval Latin it was called "herba Roberti" and the English form "herbe Robert" was used in the thirteenth century. It is said to be named after Saint Robert or Ruprecht who taught its medicinal uses, but it may have really been derived from "herba rubra" or "red herb," likely referring to the reddish hairs along the stem. The scientific name was given by the famed botanist Linneaus who probably retained "robertianum" from the early common names.

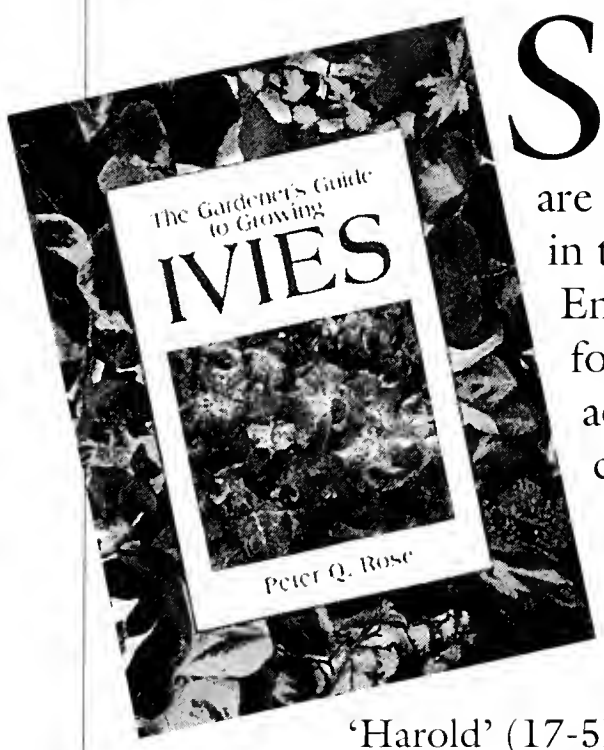
Herb Robert has been grown in Northwest gardens since at least 1913, and it was introduced to the arboretum as a good plant for woodland shade. Books about shade gardening mention this plant, which is still available in some nurseries and mail-order catalogs. Avoid it.

After planting, herb Robert quickly becomes pervasive in the garden. Its spread into dense natural woodlands in western Washington over the last several years has alarmed botanists in the region. The actual effect on native plants and ecosystems is not known at this time, but there appears to be a strong correlation between a dense spread of herb Robert in the forest understory and a reduction of native species.

Herb Robert is an annual that appears to seed almost any time of year that there is adequate soil moisture, especially in dappled sunlight. The general cycle seems to be germination in the fall, with tiny seedlings overwintering, barely visible to casual observation. By mid-May they have exploded in growth and are flowering. By mid-June the plants reach up to a foot or more in height and begin to die out in a dismal bleached-out pink color. At this stage the prolific seeds are shot through the air and stick to the undersides of the leaves of overhead plants by tiny hairs, waiting patiently for the fall rains to wash them to the ground. Sometimes seeds also germinate in the spring, and in irrigated sites germination has been observed throughout the growing season. Some individual plants may even be perennial and persist for two or three years.

The arboretum's strategies for control have been to hand weed at all times of the year, using

WHERE IN THE ARBORETUM? IDEAL IVIES



Some ivy cultivars are less invasive and are more interesting in the garden than English ivy. See the following acceptable ivy cultivars throughout the arboretum:

'Harold' (17-5E)
'Ivalace' (1S-5E)
'Lace Veil' (17-5E)
'Tricolor' (0-5E)

A new book on ivy cultivars~

Rose, Peter Q. *The Gardener's Guide to Growing Ivies.* Portland, OR: Timber Press, 1996.—recommended by Librarian Valerie Easton, Elisabeth C. Miller Library, Center for Urban Horticulture

a weed-eater (string trimmer) to mow it down, as well as the use of pre-emergent herbicides. The primary goal is to remove it before it goes to seed. Best success has been to weed in the fall, after the rains have set in to wash down the seed, then to apply a pre-emergent herbicide and mulch over the top. This plant will eat your garden, so remove it as soon as you see it and encourage your neighbors to do the same.

Spurge Laurel

Spurge laurel (*Daphne laureola*) was introduced to the arboretum from an Arboretum Foundation member's garden in the late 1950s. At that time, a few specimens were planted near the Winter Garden. Looking at the current distribution of the species throughout the arboretum, it looks like a favorite of the curatorial staff for new plantings. In fact, plants in other parts of the arboretum besides the Winter Garden seeded in after being distributed by birds.

While the additional plants may not have been intentionally planted, the seedlings have often been viewed benevolently by the staff and allowed to naturalize without much of a fight. Recently, however, its aggressive root system seems to be stunting the growth of adjacent woody plants.

After the birds eat *Daphne laureola* seeds in the arboretum, they perch on a tree branch of an accessioned plant. There they digest their meal and deposit the seed on the shady, undisturbed soil beneath. The seed readily germinates, and the growing plant competes with the desirable accessioned plant for water and nutrients. Dramatic evidence of this competitive ability was found near a dove tree (*Davidia involucrata*), which was smaller in size than others nearby of the same age. The spurge-laurel growing close to its base was thought to be part of the reason. When the spurge-laurel's extensive fleshy root system was removed, the dove tree took off in growth.

Arboretum control measures mostly include removing plants as they are found in the course of work. Intentional plantings in the arboretum are also being removed because seedlings are now popping up in adjacent neighborhoods, and the arboretum wants to be a good neighbor. There is also some concern that this plant could escape these urban settings; it has already become a problem in Northwest forests. In Canada, for example, the Ministry of Forests has identified spurge-laurel as a problem in British Columbia forests; thus it could easily become a problem in Washington.

Lessons for Gardeners

Sometimes gardeners intentionally share plants with each other. Many gardeners are pleased when a new plant begins to volunteer in the garden because it means that they can increase the number of plants they have without buying more.

The less pleasant flip side of plant volunteers is that a plant that spreads freely is in danger of leaving your garden and becoming a pest in nearby gardens and natural areas.

Some plants that volunteer in the garden will not be able to establish themselves outside a garden because they need more water in the growing season than our Mediterranean-type climate provides. Others may only disperse a few seeds a year into an immediately adjacent area.

But if a plant shows truly aggressive tendencies in the garden, these negative qualities perhaps should be given more weight that its aesthetics. For instance, a few years ago one of the authors planted a Himalayan honeysuckle (*Leycesteria formosa*) in her yard. Although it grew well and filled the space in the garden with its interesting flowers and fruits, it also filled the garden with seedlings. This species is considered a natural-area weed in New Zealand (a country with a climate very similar to western Washington). Its weed potential was thus considered to be greater than its aesthetic appeal, and it was removed from the garden. If only the first few growers of herb Robert had done the same!

Christina Pfeiffer is University of Washington staff horticulturist of Washington Park Arboretum.

Sarah Hayden Reichard, Ph.D., is a research assistant professor at the University of Washington's Center for Urban Horticulture.

Soundscape

BY BRIAN THOMPSON

A living display of water-wise turf & ground covers for the Northwest garden

Soundscape is a new, ongoing outdoor exhibit at the University of Washington's Center for Urban Horticulture (CUH). Drop by to get tips on how to design, install, and maintain a landscape that is sensitive to environmental concerns.

The Soundscape Program was developed by the Water Conservation Office of the former Seattle Water Department (now part of the Seattle Public Utilities). Project Manager Nota Lucas views Soundscape as an opportunity for the public to see, rather than just read about, good soil preparation, plant selection and siting, irrigation, and maintenance techniques.

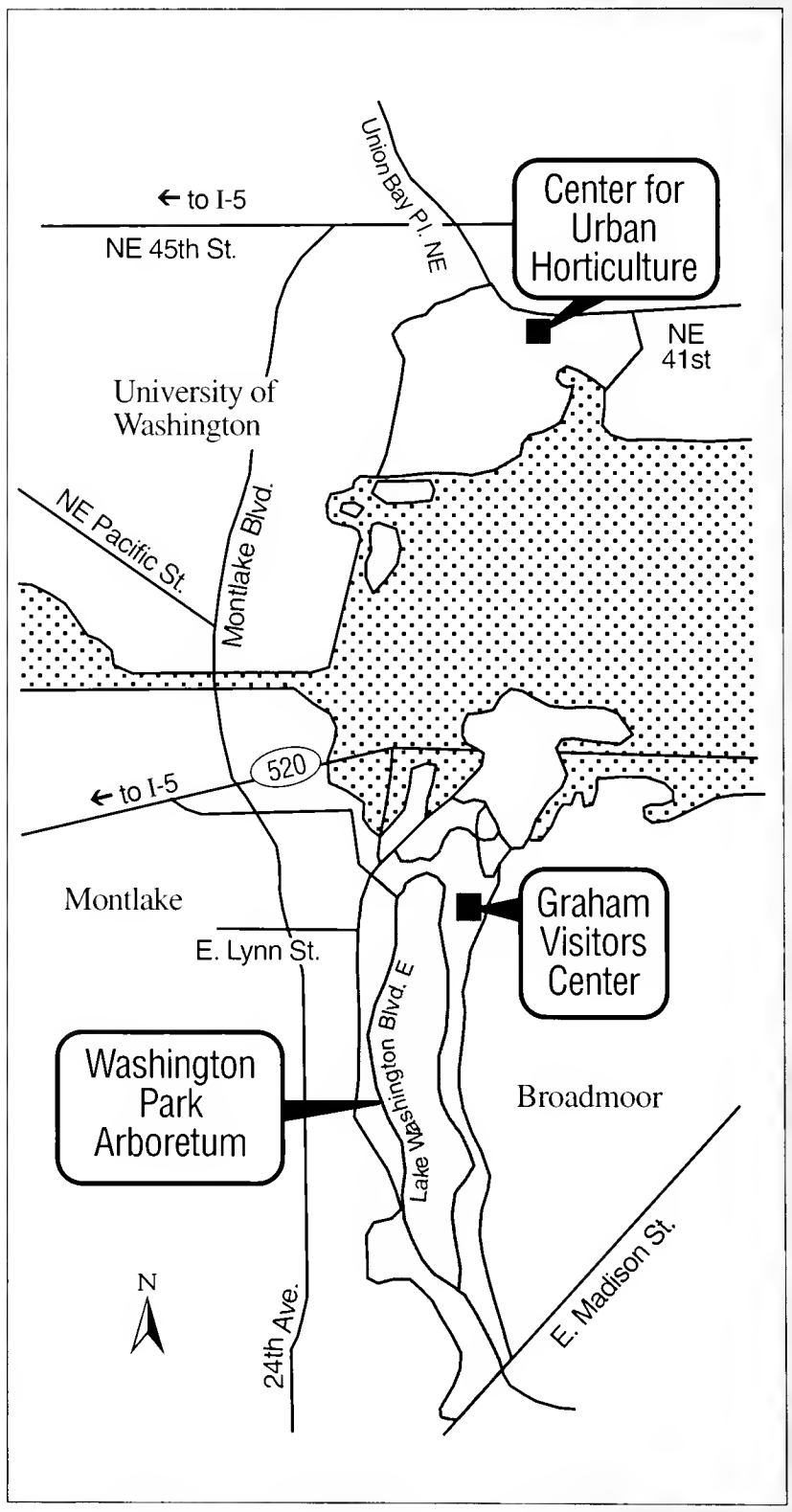
Lucas considers the drought and watering restrictions of 1992 to be a "wake-up call for the public...a short-term curtailment issue which is quite different than the way we promote conservation over the long term."

As a lawn and garden demonstration, Soundscape does more than promoting water conservation, good water quality, and recycling. The project also shows an excellent array of plants and lawn grasses in very attractive designs that are feasible for the home garden.

The heart of the garden is the lawn trials. Side-by-side comparisons of turf grass show the effects of different soil preparations and watering schedules in various combinations. Other areas showcase drip irrigation, the use of highly treated, recycled wastewater for lawn watering, how to design a drainage swale for runoff, and an "Ecoturf" lawn that contains a mixture of grass types and broadleaf perennials.

The remainder of the site is divided into four water-wise ornamental plantings—gardens that test the ability of over one hundred, readily available plants to thrive in a low-water, low-maintenance, sunny setting. Selections include small- to medium-size shrubs, dwarf conifers, herbaceous perennials, grasses, and a few small trees.

Visit Soundscape's display gardens at the Center for Urban Horticulture. While you're there, stop by the Elisabeth Miller Horticultural Library for a book list and more information about water-wise gardening.



SOUNDSCAPE GROUND COVER DEMONSTRATION GARDEN AT THE CENTER FOR URBAN HORTICULTURE. SEE THE MAP AND PLANT LIST, NEXT PAGE. PHOTO BY NOTA LUCAS

Four professional organizations were asked to sponsor the gardens, including design and plant selection.

One garden includes only Pacific Northwest native plants or their cultivars. Sponsored by the Association for Women in Landscaping, the emphasis here is on woody plants and includes many evergreens. Two other gardens, sponsored by the Washington Association of Landscape Professionals and the Washington State Nursery and Landscape Association, respectively, explore the use of non-invasive exotics in mixed plantings of both woody and herbaceous selections. The King County Master Gardeners sponsored the final garden, which features ground cover plants that provide year round interest.

In the ground cover garden, one can see how wild strawberry (*Fragaria chiloensis*) and *Rubus calycinoides* 'Emerald Carpet' blend together to form a deep green mat, and how the silver-green leaves of *Artemisia* 'Powis Castle' would hold their own near the showiest of floral displays.

Not all the plants are success stories. A few have died, and others are being overrun by their more aggressive neighbors or by weeds. Even these failures, however, give excellent examples of what to avoid and what to strive for in home gardens.

Soundscape is open during daylight hours at the Center for Urban Horticulture, north of the main driveway. Signs within the large, interpretive shelter and throughout the site give extensive detail on each project, map the plantings, and indicate the methods and materials used in each of the lawn plots. Well-written brochures are available on site.

You can also sample Soundscape and find updates on the project, by visiting the Web site at:

http://www.pan.ci.seattle.wa.us/seattle/util/dw/cons/gg_sound.htm

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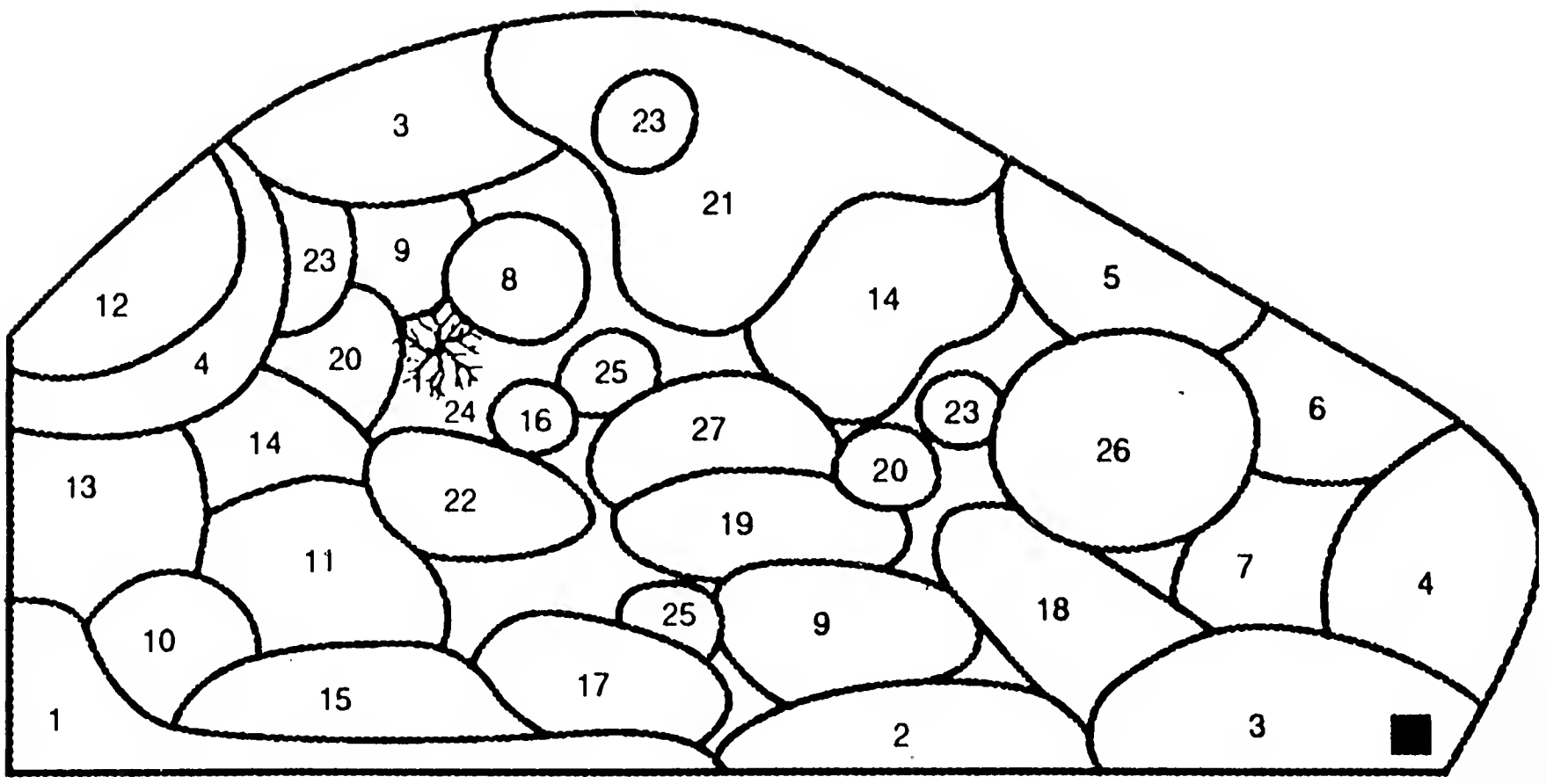
Brian Thompson is a librarian at the Elisabeth C. Miller Library, CUH. He is an authority on gladiolus.

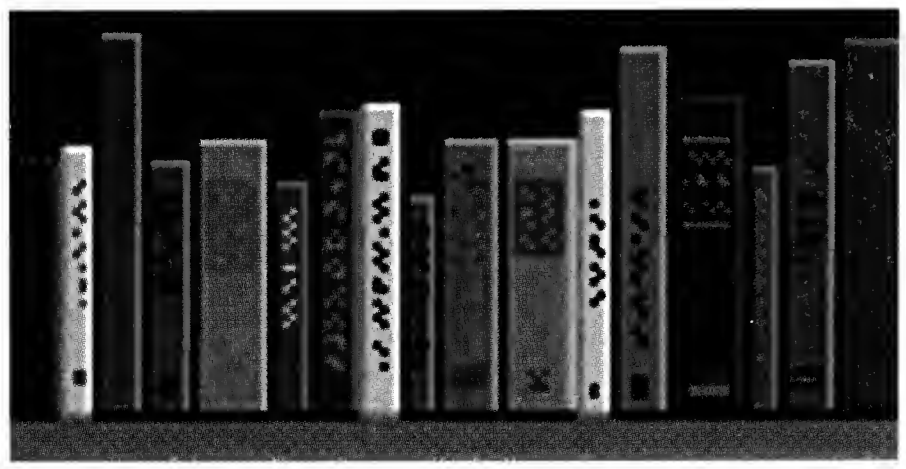
See the water-wise ground cover map and plant list, next page.

Water-Wise Ground Covers Soundscape's Diagram & Plant List

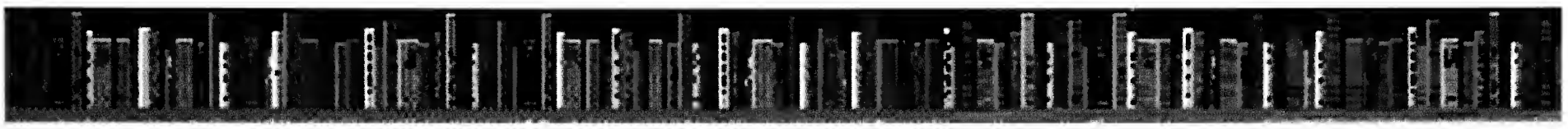
1. *Potentilla nepalensis* 'Willmottiae' (Miss Willmott's potentilla)
2. *Thymus pseudolanuginosus* 'Archer's Gold' (Archer's Gold thyme)
3. *Fragaria chiloensis* (wild strawberry)
4. *Rubus calycinoides* 'Emerald Carpet' (Emerald Carpet rubus)
5. *Lithodora diffusa* 'Grace Ward' (Grace Ward lithodora)
6. *Festuca ovina* var. *glauca* 'Elijah Blue' (Elijah Blue blue fescue)
7. *Lavandula angustifolia* (English lavender)
8. *Artemisia* 'Powis Castle' (Powis Castle artemisia)
9. *Geranium cani*
(Bic
10. *Scabiosa caucasica* 'Butterfly Blue' (Butterfly Blue scabiosa)
11. *Teucrium chamaedrys* (germander)
12. *Ajuga reptens* (ajuga)
13. *Potentilla neumanniana* 'Nana' (spring cinquefoil)
14. *Heuchera* 'Mt. St. Helens' (Mt. St. Helens heuchera)
15. *Anagallis monelli* 'Pacific Blue' (Pacific blue pimpernell)
16. *Laurentia fluviatilis* (blue star creeper)
17. *Rosmarinus officinalis* (rosemary)
18. *Armeria maritima* 'Laucheana' (Laucheana armeria)
19. *Helianthemum nummularium* (sunrose)
20. *Sedum telephium* 'Autumn Joy' (Autumn Joy sedum)
21. *Arctostaphylos uva-ursi* 'Vancouver Jade' (Vancouver Jade kinnikinnick)
22. *Arabis caucasica* 'Variegata' (variegated rockcress)
23. *Phalaris arundinacea* 'Picta' (Picta ribbon grass)
24. *Magnolia grandiflora* (southern magnolia)
25. *Pennisetum alopecuroides* 'Little Bunny'(Little Bunny fountain grass)
26. *Gaultheria shallon* (salal)



For Further Information: Gardening by the Book



BY VALERIE EASTON

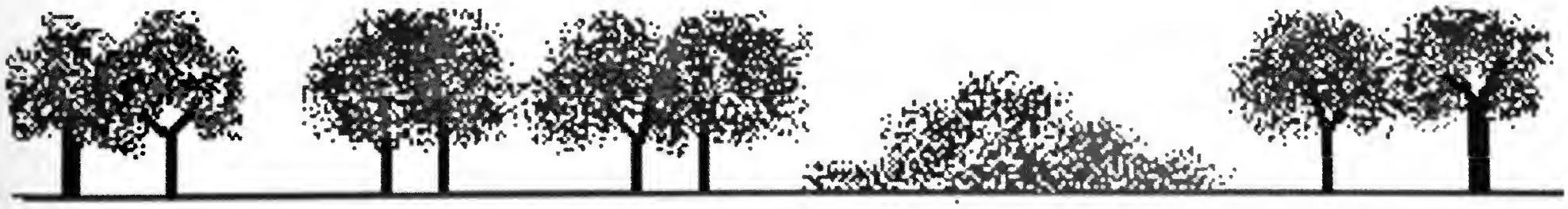


Even the most experienced gardeners need their memories jogged some times—which month do I fertilize, or prune, or divide each plant? And when we or our gardens get a bit stale and unadventurous, reading the descriptions of plant highlights for a given month or season spurs us on to add new plants or create more pleasing garden combinations. Several guides to seasonal gardening—some oriented to tasks, others to which plants shine at a given time—are specific to our Northwest climate and concerns.

Sunset Western Garden Annual: 1996 edition. Menlo Park, CA: Sunset Publishing, 1996. All the previous years' gardening and outdoor living articles from *Sunset Magazine* are gathered in this yearly compilation. The arrangement is by month, with the handy Pacific Northwest Checklist for reminders of significant tasks. Better yet, turn to June to find articles on blue-flowered perennials, sunflowers for cutting, drip irrigation, and sources for native plants; September has tomato recipes, information on enriching poor soil, and ideas for fall planting, among others. The thorough subject index is useful for finding information by plant or topic—much quicker than thumbing through old issues. A collection of these garden annuals could serve as a reference library for Northwest gardeners.

Cascadia: Inspired Gardening in the Pacific Northwest. Ann Lovejoy. Seattle: Sasquatch Books, 1997. Ann Lovejoy's newest title is a beautifully photographed picture book, with accompanying essays paying lyrical tribute to Northwest weather, geography, and garden styles. The last third of the book focuses on each month of the gardening year; the information is general, but the photos are lovely and specific plants are recommended. Advice is detailed for our climate: In February, "The wise move slowly, pulling away last year's withered growth but replacing protective mulch"; in March, "When pudgy Dutch crocus bloom it is time to sow radishes, celery and mustard greens and plant asparagus." This seasonal section of the book is my favorite if for no other reason than it is both inspiring and rewarding to see the Pacific Northwest gardening year laid out in twelve pages of advice, comment, and photos.

Trees and Shrubs for Pacific Northwest Gardens. John A. Grant, Carol Grant, et al. 2nd ed. Portland, OR: Timber Press, 1990. This book has so many uses that gardeners often forget the little section toward the back, on the garden month by month:"This chapter is a



thumbnail sketch of some outstanding garden pictures which can be created each month by the imaginative use of plant materials described in the body of the book." No better advice on how to use plants can be found than in the cumulative wisdom of both Grants, Marvin Black, Brian Mulligan, and Joseph and Jean Witt.

The Twelve Month Gardener: A West Coast Guide. Elaine Stevens, et al. Vancouver, BC: Whitecap Books, 1991. If each of us took a few minutes at the beginning of every month to look through the corresponding monthly section in this guide, we'd all be better gardeners. This practical handbook, written by five British Columbia Master Gardeners, serves as the most comprehensive source book written for the Northwest on the specifics of gardening. It is a book to read through and then refer back to each month, whether you are a new or a veteran gardener. Each month contains a summary of the garden, plant highlights, a checklist of tasks, and articles and plant lists of great detail. The seasonal subjects range from roses and summer-flowering shrubs for June, to water gardens and drying flowers in August. Completing this most useful of gardening guides are sources, book lists, a glossary, and information on common Northwest gardening problems, such as moss, powdery mildew, and slugs.

Also Recommended:

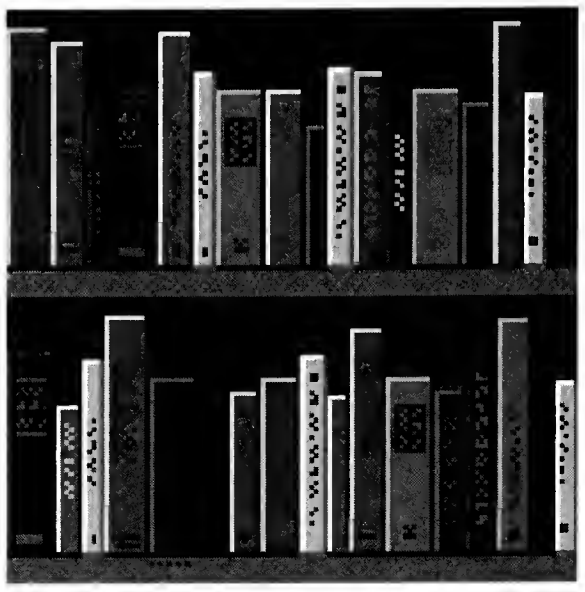
Hanley, John H. *Year-Round Gardening in the West.* Lincoln, NE: Johnsen Publishing Company, 1956.

Lovejoy, Ann. *The Year in Bloom: Gardening for All Seasons in the Pacific Northwest.* Seattle: Sasquatch Books, 1987.

McNeilan, Ray A., and Micheline Ronningen. *Pacific Northwest Guide to Home Gardening.* Portland, OR: Timber Press, 1982.

Tarrant, David. *David Tarrant's Pacific Gardening Guide.* Vancouver, BC: Whitecap Books, 1990.

Willis, A. R. *The Pacific Gardener.* Sidney, BC: Gray's Publishing Canada, 1964.



New on the Shelves

BY VALERIE EASTON

Beales, Peter. *Visions of Roses.* Boston: Little, Brown, 1996.

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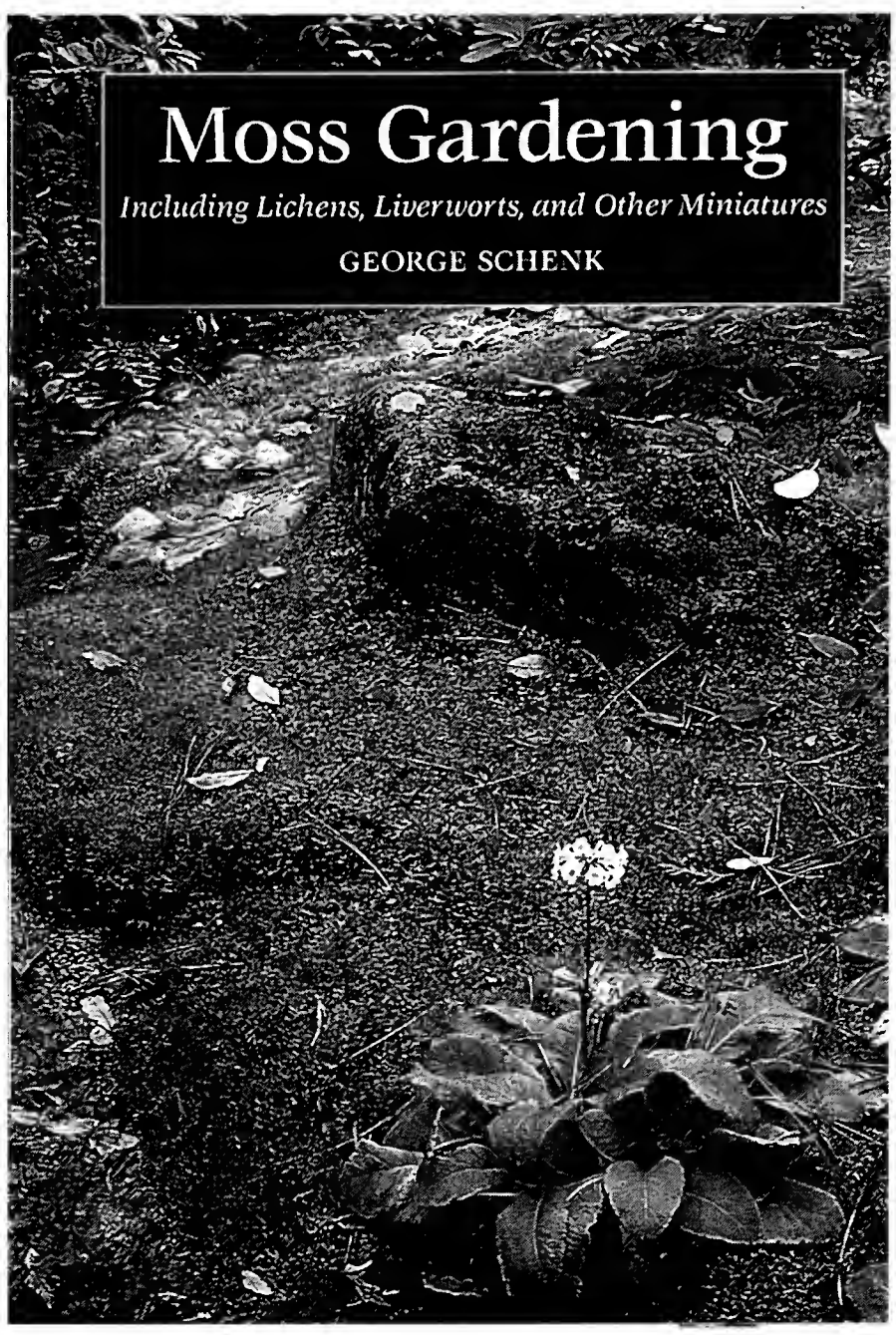
Valerie Easton is librarian at the Elisabeth C. Miller Library at the University of Washington's Center for Urban Horticulture. She writes for national and regional publications and is a board member of the *Bulletin*.

Moss Gardening

George Schenk. Portland, OR: Timber Press, 1997. Hard cover, $34.95.



Mosses and lichens, among the most primitive life forms, inspire mixed feelings in many people. When I was young, during the final, terrifying scene of a ghost story, the hero discovers he has moss growing between his fingers. George Schenk's book, *Moss Gardening: Including Lichens, Liverworts, and Other Miniatures*, does much to dispel the myths about this intriguing group of plants.

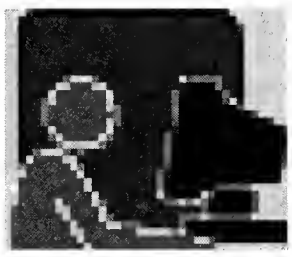
"Mosses, as the world knows, are little green plants." Schenk methodically plots an accessible path through the complexities of nomenclature, uses, and appeal of mosses and lichens. Never losing his sense of awe, he describes the differences and growth habits. The author writes as one intelligent gardener to another, and he provides an aesthetic sensibility to which it is easy to respond. Few gardeners are handy with the botanic names of mosses, yet by the third chapter the differences between mosses, liverworts, and moss-like plants seem readily apparent.

Most approach moss with reverence in famous gardens and fear in their own. Moss comes to most gardens uninvited. To questions of unwanted moss on roofs, Schenk is dismissive, pointing to examples where a moss-covered asphalt roof has lasted forty years. He argues that the sun and wind are the chief destroyers of roof material, and moss and lichen protect, even insulate, the roof. The buyers of moss killer will probably not be dissuaded, however. This book also contains much good practical advice on how to encourage moss. Ironically enough, one method is to annually apply herbicides.

The book's excellent photographs are well annotated and inspirational. A bibliography on mosses and related topics features the author's comments.

George Schenk is a charming and amusing writer. His book, *The Compleat Shade Gardener* (Boston: Houghton Mifflin, 1987), is a classic. Of course, he is the best one to introduce us to this plant group we have always known, but never known that much about. Mosses were here long before we were and will probably outlast us. This book reads like a knowledgeable celebration of old friends, and is an invitation to take off shoes and socks and sink toes into infinite, sensual coolness.—*Reviewed by Douglas Bayley*

Douglas Bayley is a landscape designer and curator of the historic Dunn Gardens in North Seattle.



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WHERE IN THE ARBORETUM ? SUMMER HIGHLIGHTS

Summer is a perfect time to visit. Get directions and a map at the Graham Visitors Center.

BY REGEN DENNIS

PHOTOS BY JOY SPURR

Summer is the perfect season to discover popular as well as little-known treasures in the Arboretum.

Start your adventure on Arboretum Drive East, about midway along the eastern edge, to find the arboretum's notable legume collection. This garden literally bursts forth with yellow and white flowers, complemented by the white or yellow pea-like flowers on the unusual *Maackia* trees. Head north and look on the east side of the road to see a striking collection of rock roses (*Cistis*) with their mauve, purple, and white blossoms, interplanted with fragrant lavender.

At Honeysuckle Hill, just east of Lake Washington Boulevard East, the fragrant blooms of the extensive honeysuckle (*Lonicera)* collection fill the air with sweet perfume. The stunning rose-pink flowers are attractive and popular with bees as well as humans.

Hydrangeas are Northwest favorites, and the acidic soil in the arboretum really brings out the whites, blues, purples, and reds in its collection. You can find dozens of unusual and hard-to-find specimens.

In striking contrast to the green lushness of summer foliage is the subtle rock-garden look of the New Zealand High Country Exhibit. A collection of native plants, most of which flower in the summer, offer unusual and interesting substance and form. Dedicated by New Zealand's ambassador to the United States in November 1993, the exhibit replicates Arthur's Pass on the South Island.

As summer nears its end and most bloomers are finished, the *Eucryphia* takes center stage. You will find a collection of these unusual, large green-leaved shrubs bursting into a bundle of white flowers by taking just a short walk west of Arboretum Drive East, a few hundred feet south of the Lookout gazebo.

You will see ornamental fruit soon, which adds color to the summer garden. Also look for cones, fascinating any time of year. Find them on conifers throughout the arboretum.

If you discover a tree or shrub that you can't live without, you can get it propagated. Leave a message for The Arboretum Foundation volunteers who work at the Pat Calvert Greenhouse (325-4510). Then, look forward to having a bit of the arboretum flowering in your garden in years to come.

Regen Dennis is the public relations contractor to the Washington Park Arboretum.

WOODY PLANTS WITH SUMMER INTEREST

UPPER RIGHT: UNUSUAL HYDRANGEAS, SUCH AS H. MACROPHYLLA 'MME MOUILLIERE', ARE POPULAR THROUGHOUT THE SUMMER.

OPPOSITE PAGE: UPPER LEFT, WHITE FLOWERS OF STEWARTIA MONADELPHA. UPPER RIGHT, SORBARONIA ALPINA VAR. 'SUPERARIA' IN AUGUST. MIDDLE LEFT: AUGUST BERRIES OF COTONEASTER HUPEHENSIS. MIDDLE RIGHT: GORGEOUS HIPS OF ROSA MOYESII VAR. FARGESII IN AUGUST. LOWER LEFT: IN JULY, FIND LOMATIA MYRICOIDES IN THE NEW ZEALAND GARDEN. LOWER RIGHT: CONES OF LARIX GMELINII 'OLGENSIS' IN THE ARBORETUM IN MID-SUMMER.

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ARBORETUM

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